CLAIM AMENDMENTS

1.   (Original)

An image processing method comprising:

subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data; and

conducting a pre-processing before the optimization processing is carried out;

wherein, the pre-processing comprises to transform the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of a frequency characteristic specific to the image-capturing device from the frequency characteristic of the captured-image data.

2.   (Original)

The image processing method of claim 1, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model.

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3.   (Original)

The image processing method of claim 1, wherein the pre-processing further comprises to transform the gradation characteristic of the captured-image data into a scene-referred gradation characteristic by removing the effect of a gradation characteristic specific to the image-capturing device from the gradation characteristic of the captured-image data.

4.   (Original)

The image processing method of claim 3, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model.

5.   (Original)

The image processing method of claim 3, wherein the gradation characteristic specific to the image-capturing device is a model gradation characteristic specific to an image-capturing device model.

6.   (Original)

    The image processing method of claim 3, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model, and the gradation characteristic specific to the image-capturing device is a model gradation characteristic specific to the image-capturing device model.

7.   (Original)

    An image processing method comprising:

    subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data;

    generating condition data for outputting the captured-image data to an output medium on the basis of condition data for carrying out a pre-processing before the optimization processing is carried out, the pre-processing comprising to transform the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of frequency characteristic specific to the image-capturing device from the frequency characteristic of the captured-image data,

and on the base of condition data for carrying out the optimization processing.

8.   (Original)

The image processing method of claim 7, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model.

9.   (Original)

The image processing method of claim 7, wherein the pre-processing further comprises to transform the gradation characteristic of the captured-image data into a scene-referred gradation characteristic by removing the effect of a gradation characteristic specific to the image-capturing device from the gradation characteristic of the captured-image data.

10. (Original)

The image processing method of claim 9, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model.

11.   (Original)

The image processing method of claim 9, wherein the gradation characteristic specific to the image-capturing device is a model gradation characteristic specific to an image-capturing device model.

12.   (Original)

The image processing method of claim 9, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model, and the gradation characteristic specific to the image-capturing device is a model gradation characteristic specific to the image-capturing device model.

13.   (Original)

The image processing method of claim 2, wherein the information on the model frequency characteristic is obtained from the captured-image data.

14.   (Original)

The image processing method of claim 8, wherein the information on the model frequency characteristic is obtained from the captured-image data.

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15. (Original)

The image processing method of claim 5, wherein the information on the model gradation characteristic is obtained from the captured-image data.

16. (Original)

The image processing method of claim 11, wherein the information on the model gradation characteristic is obtained from the captured-image data.

17. (Original)

The image processing method of claim 1, wherein the frequency characteristic of the captured-image data is transformed into the scene-referred frequency characteristic by compensating for the difference in the frequency band between each of the image-capturing device.

18. (Original)

The image processing method of claim 7, wherein the frequency characteristic of the captured-image data is transformed into the scene-referred frequency characteristic by compensating for the difference in the frequency band between each of the image-capturing device.

19. (Original)

The image processing method of claim 1, wherein when the frequency characteristic of the captured-image data is transformed into the scene-referred frequency characteristic, the frequency characteristic of the captured-image data is transformed into a predetermined standard frequency characteristic.

20. (Original)

The image processing method of claim 7, wherein when the frequency characteristic of the captured-image data is transformed into the scene-referred frequency characteristic, the frequency characteristic of the captured-image data is transformed into a predetermined standard frequency characteristic.

21. (Original)

The image processing method of claim 19, wherein the predetermined standard frequency characteristic is a frequency characteristic such that the resolution vs. frequency varies linearly.

22. (Original)

The image processing method of claim 20, wherein the

predetermined standard frequency characteristic is a frequency characteristic such that the resolution vs. frequency varies linearly.

23. (Original)

The image processing method of claim 19, wherein the predetermined standard frequency characteristic is a frequency characteristic such that resolution vs. frequency varies in accordance with the visual characteristic of the human eyes.

24. (Original)

The image processing method of claim 20, wherein the predetermined standard frequency characteristic is a frequency characteristic such that resolution vs. frequency varies in accordance with the visual characteristic of the human eyes.

25. (Original)

The image processing method of claim 1, wherein in the course of subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, after the captured-image data are subjected to an exposure

control processing for correcting the brightness and a gray
balance adjustment processing for correcting the color bias, the
captured-image data are subjected to a gradation
compensation processing for correcting the gradation.

26. (Original)

     The image processing method of claim 7, wherein in the
course of subjecting captured-image data outputted from an
image-capturing device to an optimization processing for
appreciation to produce viewing image referred image data,
after the captured-image data are subjected to an exposure
control processing for correcting the brightness and a gray
balance adjustment processing for correcting the color bias, the
captured-image data are subjected to a gradation
compensation processing for correcting the gradation.

27. (Original)

     The image processing method of claim 25, wherein when
the gradation compensation processing is carried out, the
captured-image data are corrected to become non-linear.

28. (Original)

     The image processing method of claim 26, wherein when
the gradation compensation processing is carried out, the

captured-image data are corrected to become non-linear.

29. (Original)

An image processing apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, comprising:

a storage section for storing model frequency characteristics of a plurality of image-capturing device models;

an acquisition section for obtaining a model frequency response characteristic corresponding to the designated image-capturing device out of the model frequency response characteristics stored in the storage section;

a frequency characteristic compensation section for transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the obtained model frequency characteristic from the frequency characteristic of the captured-image data to correct the frequency characteristic of the captured-image data; and

a control section for controlling to carry out a pre-processing so that the frequency characteristic compensation section corrects the frequency characteristic of captured-image

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data, before the optimization processing is carried out.

30.　(Original)

An image processing apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, comprising:

a storage section for storing model frequency characteristics and model gradation characteristics of a plurality of image-capturing device models;

an acquisition section for obtaining a model frequency characteristic and a model gradation characteristic corresponding to the designated image-capturing device out of the model frequency characteristics and model gradation characteristics stored in the storage section;

a frequency characteristic compensation section for transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the obtained model frequency response characteristic from the frequency characteristic of the captured-image data to correct the frequency characteristic of the captured-image data;

a gradation characteristic compensation section for transforming the gradation characteristic of the captured-

image data into the scene-referred gradation characteristic by removing the effect of the obtained model gradation characteristic from the gradation characteristic of the captured-image data to correct the gradation characteristic of captured-image data; and

a control section for controlling to carry out a pre-processing so that the frequency characteristic compensation section corrects the frequency characteristic of captured-image data and the gradation characteristic compensation section corrects the gradation characteristic of captured-image data, before the optimization processing is carried out.

31. (Original)

An image processing apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, comprising:

a storage section for storing model frequency characteristics of a plurality of image-capturing device models;

an acquisition section for obtaining a model frequency response characteristic corresponding to the designated image-capturing device out of the model frequency response characteristics stored in the storage section;

a pre-processing condition calculating section for

calculating condition data for carrying out a pre-processing to transform the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the obtained model frequency response characteristic from the frequency characteristic of the captured-image data;

an optimization condition calculating section for calculating condition data for carrying out the optimization processing,

an output condition calculating section for calculating condition data for outputting the captured-image data onto an output medium on the basis of the condition data calculated by the pre-processing condition calculating section and the optimization condition calculating section; and

an image data generating section for generating image data for output on the basis of the condition data calculated by the output condition calculating section.

32. (Original)

An image processing apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, comprising:

a storage section for storing model frequency

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characteristics and model gradation characteristics of a
plurality of image-capturing device models;

an acquisition section for obtaining a model frequency
characteristic and a model gradation characteristic
corresponding to the designated image-capturing device out of
the model frequency response characteristics and model
gradation characteristics stored in the storage section;

a pre-processing condition calculating section for
calculating condition data for carrying out a pre-processing for
transforming the frequency characteristic of the captured-image
data into the scene-referred frequency
characteristic by removing the effect of the obtained model
frequency characteristic from the frequency characteristic of
the captured-image data, and transforming the gradation
characteristic of the captured-image data into the scene-
referred gradation characteristic by removing the effect of
the obtained model gradation characteristic from the
gradation characteristic of the captured-image data;

an optimization condition calculating section for
calculating condition data for carrying out the optimization
processing;

an output condition calculating section for calculating
condition data for outputting the captured-image data onto an
output medium on the basis of the condition data calculated by

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the pre-processing condition calculating section and the

optimization condition calculating section; and

an image data generating section for generating image

data for output on the basis of the condition data calculated by

the output condition calculating means.

33. (Original)

The image processing apparatus of claim 29, wherein the

information on the model frequency characteristic is obtained

from the captured-image data.

34. (Original)

The image processing apparatus of claim 31, wherein the

information on the model frequency characteristic is obtained

from the captured-image data.

35. (Original)

The image processing apparatus of claim 30, wherein the

information on the model gradation characteristic is obtained

from the captured-image data.

36. (Original)

The image processing apparatus of claim 32, wherein the

information on the model gradation characteristic is obtained

from the captured-image data.

37. (Original)

The image processing apparatus of claim 29, wherein the processing of transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic is a processing of compensating for the difference in the frequency band between each of the image-capturing device.

38. (Original)

The image processing apparatus of claim 31, wherein the processing of transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic is a processing of compensating for the difference in the frequency band between each of the image-capturing device.

39. (Original)

The image processing apparatus of claim 29, wherein the processing of transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic is a processing of transforming the frequency characteristic of the captured-image data into a predetermined

standard frequency characteristic.

40. (Original)

The image processing apparatus of claim 31, wherein the processing of transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic is a processing of transforming the frequency characteristic of the captured-image data into a predetermined standard frequency characteristic.

41. (Original)

The image processing apparatus of claim 39, wherein the predetermined standard frequency characteristic is a frequency characteristic in which resolution varies linearly against frequency.

42. (Original)

The image processing apparatus of claim 40, wherein the predetermined standard frequency characteristic a frequency characteristic in which resolution varies linearly against frequency.

43. (Original)

The image processing apparatus of claim 39, wherein the

predetermined standard frequency characteristic is a

frequency characteristic such that resolution vs. frequency

varies in accordance with the visual characteristic of the

human eyes.

44. (Original)

The image processing apparatus of claim 40, wherein the

predetermined standard frequency characteristic is a

frequency characteristic such that resolution vs. frequency

varies in accordance with the visual characteristic of the

human eyes.

45. (Original)

The image processing apparatus of claim 29, wherein

in the course of the optimization processing, the control

section controls to generate the viewing image referred image

data through compensating the gradation after the captured-image

data has been corrected in the brightness and in the color bias.

46. (Original)

The image processing apparatus of claim 31, wherein in the

course of the optimization processing the optimization condition

calculating section calculates condition data for

generating the viewing image referred image data through

compensating the gradation after correcting the brightness and the color bias of the aforesaid captured-image data.

47. (Original)

The image processing apparatus of claim 45, wherein the processing of compensating the gradation comprises a non-linear compensation processing.

48. (Original)

The image processing apparatus of claim 46, wherein the processing of compensating the gradation comprises a non-linear compensation processing.

49. (Original)

An image recording apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, and for forming an image represented by the viewing image referred image data on an output medium, comprising:

a storage section for storing model frequency characteristics of a plurality of image-capturing device models;

an acquisition section for obtaining a model frequency

response characteristic corresponding to the designated image-capturing device out of the model frequency response characteristics stored in the storage section;

a frequency characteristic compensation section for transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the obtained model frequency characteristic from the frequency characteristic of the captured-image data to correct the frequency characteristic of the captured-image data;

a control section for controlling to carry out a pre-processing so that the frequency characteristic compensation section corrects the frequency characteristic of captured-image data, before the optimization processing is carried out.

50. (Original)

An image recording apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, and for forming an image represented by the viewing image referred image data on an output medium, comprising:

a storage section for storing model frequency characteristics and model gradation characteristics of a

plurality of image-capturing device models;

an acquisition section for obtaining a model frequency characteristic and a model gradation characteristic corresponding to the designated image-capturing device out of the model frequency characteristics and model gradation characteristics stored in the storage section;

a frequency characteristic compensation section for transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the obtained model frequency response characteristic from the frequency characteristic of the captured-image data to correct the frequency characteristic of the captured-image data;

a gradation characteristic compensation section for transforming the gradation characteristic of the captured-image data into the scene-referred gradation characteristic by removing the effect of the obtained model gradation characteristic from the gradation characteristic of the captured-image data to correct the gradation characteristic of captured-image data; and

a control section for controlling to carry out a pre-processing so that the frequency characteristic compensation section corrects the frequency characteristic of captured-image data and the gradation characteristic compensation section

corrects the gradation characteristic of captured-image data, before the optimization processing is carried out.

51. (Original)

An image recording apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, and for forming an image represented by the viewing image referred image data on an output medium, comprising:

a storage section for storing model frequency characteristics of a plurality of image-capturing device models;

an acquisition section for obtaining a model frequency response characteristic corresponding to the designated image-capturing device out of the model frequency response characteristics stored in the storage section;

a pre-processing condition calculating section for calculating condition data for carrying out a pre-processing to transform the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the obtained model frequency response characteristic from the frequency characteristic of the captured-image data;

an optimization condition calculating section for calculating condition data for carrying out the optimization processing,

an output condition calculating section for calculating condition data for outputting the captured-image data onto an output medium on the basis of the condition data calculated by the pre-processing condition calculating section and the optimization condition calculating section; and

an image data generating section for generating image data for output on the basis of the condition data calculated by the output condition calculating section.

52. (Original)

An image recording apparatus for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, and for forming an image represented by the viewing image referred image data on an output medium, comprising:

a storage section for storing model frequency characteristics and model gradation characteristics of a plurality of image-capturing device models;

an acquisition section for obtaining a model frequency characteristic and a model gradation characteristic

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corresponding to the designated image-capturing device out of the model frequency response characteristics and model gradation characteristics stored in the storage section;

a pre-processing condition calculating section for calculating condition data for carrying out a pre-processing for transforming the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the obtained model frequency characteristic from the frequency characteristic of the captured-image data, and transforming the gradation characteristic of the captured-image data into the scene-referred gradation characteristic by removing the effect of the obtained model gradation characteristic from the gradation characteristic of the captured-image data;

an optimization condition calculating section for calculating condition data for carrying out the optimization processing;

an output condition calculating section for calculating condition data for outputting the captured-image data onto an output medium on the basis of the condition data calculated by the pre-processing condition calculating section and the optimization condition calculating section; and

an image data generating section for generating image data for output on the basis of the condition data calculated

by the output condition calculating means.

53. (Original)

A recording medium capable of being read by a computer, which carries out an image processing for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, wherein the recording medium is recorded a program code for actualizing a function to carry out a pre-processing comprising to transform the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of the frequency characteristic specific to the image-capturing device from the frequency characteristic of the captured-image data, before the practice of the aforesaid optimization processing.

54. (Original)

The recording medium of claim 53, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model.

55. (Original)

The recording medium of claim 53, wherein the pre-

processing further comprises to transform the gradation characteristic of the captured-image data into a scene-referred gradation characteristic by removing the effect of a gradation characteristic specific to the image-capturing device from the gradation characteristic of the captured-image data.

56. (Original)

The recording medium of claim 55, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model.

57. (Original)

The recording medium of claim 55, wherein the gradation characteristic specific to the image-capturing device is a model gradation characteristic specific to an image-capturing device model.

58. (Original)

The recording medium of claim 55, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model, and the gradation characteristic specific to the image-

capturing device is a model gradation characteristic specific to the image-capturing device model.

59. (Original)

A recording medium capable of being read by a computer, which carries out an image processing for subjecting captured-image data outputted from an image-capturing device to an optimization processing for appreciation to produce viewing image referred image data, wherein the recording medium is recorded a program code for actualizing a function for generating condition data for outputting the captured-image data onto an output medium on the basis of condition data for carrying out a pre-processing before the optimization processing is carried out, the pre-processing comprising to transform the frequency characteristic of the captured-image data into the scene-referred frequency characteristic by removing the effect of frequency characteristic specific to the image-capturing device from the frequency characteristic of the captured-image data, and on the base of condition data for carrying out the optimization processing.

60. (Original)

The recording medium of claim 59, wherein the frequency characteristic specific to the image-capturing device is a model

frequency characteristic specific to an image-capturing device model.

61. (Original)

The recording medium of claim 59, wherein the pre-processing further comprises to transform the gradation characteristic of the captured-image data into a scene-referred gradation characteristic by removing the effect of a gradation characteristic specific to the image-capturing device from the gradation characteristic of the captured-image data.

62. (Original)

The recording medium of claim 61, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model.

63. (Original)

The recording medium of claim 61, wherein the gradation characteristic specific to the image-capturing device is a model gradation characteristic specific to an image-capturing device model.

64. (Original)

The recording medium of claim 61, wherein the frequency characteristic specific to the image-capturing device is a model frequency characteristic specific to an image-capturing device model, and the gradation characteristic specific to the image-capturing device is a model gradation characteristic specific to the image-capturing device model.

65-76. (Canceled)

77. (Original)

The image processing method of claim 3, wherein the pre-processing further comprises a processing to transform the color characteristic of the captured-image data into the scene-referred color space characteristic by removing the effect of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

78. (Original)

The image processing method of claim 9, wherein the pre-processing further comprises a processing to transform the color characteristic of the captured-image data into the scene-referred color space characteristic by removing the effect

of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

79. (Original)

The image processing apparatus of claim 30, further comprising a color characteristic compensation section for correcting the gradation characteristic of the captured-image data, through transforming the color characteristic of the captured-image data into the scene-referred color space characteristic, by removing the effect of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

80. (Original)

The image processing apparatus of claim 32, further comprising a color characteristic compensation section for correcting the gradation characteristic of the captured-image data, through transforming the color characteristic of the captured-image data into the scene-referred color space characteristic, by removing the effect of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

81. (Original)

The image processing apparatus of claim 50, further comprising a color characteristic compensation section for correcting the gradation characteristic of the captured-image data, through transforming the color characteristic of the captured-image data into the scene-referred color space characteristic, by removing the effect of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

82. (Original)

The image processing apparatus of claim 52, further comprising a color characteristic compensation section for correcting the gradation characteristic of the captured-image data, through transforming the color characteristic of the captured-image data into the scene-referred color space characteristic, by removing the effect of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

83. (Original)

The recording medium of claim 55, wherein the pre-processing further comprises a processing to transform the color characteristic of the captured-image data into the

scene-referred color space characteristic by removing the effect of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

84. (Original)

    The recording medium claim 61 wherein the pre-processing further comprises a processing to transform the color characteristic of the captured-image data into the scene-referred color space characteristic by removing the effect of the color characteristic specific to the image-capturing device from the color characteristic of the captured-image data.

85-86. (Canceled)

87. (Original)

    The image processing method of claim 77, wherein the color characteristic specific to the image-capturing device is a model color characteristic specific to an image-capturing device model.

88. (Original)

    The image processing method of claim 78, wherein the

color characteristic specific to the image-capturing device
is a model color characteristic specific to an image-
capturing device model.

89. (Original)

The image processing apparatus of claim 79, wherein the
color characteristic specific to the image-capturing device is
the model color characteristic specific to an image-capturing
device model.

90. (Original)

The image processing apparatus of claim 80, wherein the
color characteristic specific to the image-capturing device is
the model color characteristic specific to an image-capturing
device model.

91. (Original)

The image recording apparatus of claim 81, wherein the
color characteristic specific to the image-capturing device is
a model color characteristic specific to an image-capturing
device model.

92. (Original)

The image recording apparatus of claim 82, wherein the

color characteristic specific to the image-capturing device
is a model color characteristic specific to an image-
capturing device model.

93. (Original)

The recording medium of claim 83, wherein the color
characteristic specific to the image-capturing device is a
model color characteristic specific to the image-capturing
device model.

94. (Original)

The recording medium of claim 84, wherein the color
characteristic specific to the image-capturing device is a model
color characteristic specific to an image-capturing device
model.

95-96. (Canceled)